PARANOMUS.
A PROTEACEOUS GENUS WITH AN UNFORTUNATE NOMENCLATURAL HISTORY.*†

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The first species of the genus later known as *Paranomus*, was described by Bergius in 1766 under the name *Leucadendron spicatum*. It was based on a dried specimen collected by Auge and taken to Sweden by Grubb. Four further species were described in the eighteenth century, one by Sparrman and three by Thunberg. The four were assigned to Protea which was an omnibus genus at that time. All five eighteenth century species are good and should bear the specific epithets given by their original authors. Unfortunately in more recent times all but one have suffered changes of name.

The trouble began soon after 1807 when the genus Paranomus was founded by R. A. Salisbury in William Hooker's Paradisus Londiniensis. There he figured and described two species, *Paranomus Sceptrum* based on *Protea Sceptrum Gustavianum* of Sparrman and *Paranomus Lagopus* based on *Protea Lagopus* of Thunberg. The epithet *Lagopus* is retained as Thunberg gave it, but in the second species *Sceptrum Gustavianum* was shortened. Two years later Salisbury modified the latter still further to *sceptriformis*. Clearly stability of nomenclature was not a feature of those days.

Salisbury was a man of peculiar temperament and apparently intensely jealous of the well merited reputation of a rival botanist, Robert Brown, who was at that time engaged on a monumental work on all known Proteaceae. Brown gave a preliminary account of his work at a meeting of the Linnaean Society in January 1809 but publication did not take place till the following year. It is almost certain that Salisbury attended the meeting and must have been aware of the significance of Brown's work. The steps Salisbury took to annoy his rival not only damaged his own reputation but presented problems of nomenclature some of which are as yet unsolved.

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About nine months after the Linnaean meeting a book on Proteaceae appeared, purporting to have been written by Joseph Knight, a nurseryman of Chelsea. Knight was well acquainted with the family for he had at one time been employed as a gardener by George Hibbert, an enthusiastic grower of Proteaceae. It had been Hibbert who at the end of the eighteenth century had sent James Niven to the Cape to bring back dried specimens and seeds for his garden. Thus many South African species of Proteaceae were in cultivation at the beginning of the nineteenth century. The part of the book dealing with cultivation of the Proteaceae was undoubtedly written by Knight but the botanical section was equally certainly the work of Salisbury. From evidence which has come to light since those days, it is now generally accepted that Salisbury was responsible for the names of the species and their descriptions. Hence the authority for the many new species which appear in the book, is now given as "Salisb. ex Knight".

This was an unfortunate start for Paranomus and the Proteaceae in general, for some of the species in Knight's work cannot be correlated with those of Brown. Brown's work is so good that there is seldom doubt as to the identity of the species he described. In Knight's book this is certainly not the case for the descriptions are inadequate and suggest hurried preparation. Yet whenever the identity of a species can be established, Salisbury's name, having priority, must be adopted. In the South African sections of both works the species cited are often those collected by Niven whose dried specimens were preserved in well known private herbaria, notably those of Lambert and Hibbert. About the middle of the century, after the owners' deaths, some of these herbaria were sold. No one realised how important they would be to botanists of the future. For example, had Hibbert's herbarium remained intact in some public institution, then many present day difficulties of identification would never have arisen.

Robert Brown evidently liked Salisbury as little as Salisbury liked him. This feeling is reflected in Brown's decision to replace Salisbury's legitimate name Paranomus by Nivenia, merely because he disliked Salisbury's name. Even had the name Paranomus not existed, Nivenia could not have been used as it had previously been published by Ventenat for a monocotyledonous genus.

In 1891 the over-zealous Otto Kuntze realised Brown's error and restored the name Paranomus to the genus, making numbers of new combinations for Brown's species. As Kuntze had no knowledge of the species with which he was dealing, his work has no particular significance apart from providing a number of new combinations. Thus his name appears as an authority for species about which he was profoundly ignorant.

When in 1912 Phillips and Hutchinson published their account of the Proteaceae in the Flora Capensis, they decided to ignore Kuntze and retain

Brown's illegitimate name, a procedure even then contrary to the rules of nomenclature. In a paper published in 1933 N. E. Brown of Kew restored the species to the genus Paranomus and drew attention to several problems awaiting solution.

A few examples will illustrate the misfortunes which have attended attempts to identify the species.

Paranomus spathulatus (Thunb.) O. Kuntze

This species was founded by Thunberg in 1781 in one of his dissertations. Under the name *Protea spathulata* it had both a description and a figure. In the Thunberg Herbarium at Uppsala there are two sheets bearing specimens of this species. The specimens of sheet β are good but those on sheet α, though clearly the same species, are poor.

Juel in his account of Thunberg's Herbarium says that Hutchinson saw these specimens and named α *Nivenia parvifolia* R. Br. This does not agree with statements in the Flora Capensis where both specimens are placed under *Nivenia spathulata* but the figure is assigned to *Nivenia parvifolia.* This figure has been the source of much misunderstanding and calls for comment. If Juel be correct that it was made from a specimen on sheet α, then the responsibility for subsequent difficulties in nomenclature rests with the artist who depicted slender styles quite unlike any seen in this genus and certainly not appearing on any of Thunberg's specimens. Each slender style is terminated by a knob which has puzzled and misled many. Anyone who has examined Thunberg's specimens is bound to conclude that the artist drew on his imagination when he embellished his drawing in such a manner. It is particularly unfortunate for in this genus a solitary and related species possesses a knob-like ending to the style. The styles of Thunberg's figure have led botanists to assume that it was this species which Thunberg described and not the one to which the specimens belong.

Salisbury in Knight's Proteaceae describes a species *Paranomus adiantifolius* for which he cites Thunberg's deplorable figure. Fortunately he also cites a specimen collected by Niven on the mountains near the Rivier Zondereinde. This is at Kew and settles the identity of Salisbury's species for it has a knob-like pollen presenter, unique in the genus. It is a rare species with a limited distribution at high altitudes in the area where Niven first discovered it. *Paranomus spathulatus* to which it is related, is a fairly common plant on the northern foothills of the Langeberg from Barrydale to the Gouritz River.

Salisbury complicated matters by giving the name *Paranomus flabellifer* to the plant to which Thunberg had applied the epithet *spathulata.* Salisbury based his species on a plant collected by Roxburgh which is clearly the same as the one described many years earlier by Thunberg. The two species and their principal synonomy are as follows:

PARANOMUS SPATHULATUS (*Thunb.*) *O. Kuntze*
Paranomus flabellifer *Salisb. ex Knight*
Nivenia spathulata *R. Br.*
Nivenia marginata *R. Br.*
Nivenia muirii *Phill. & Hutch.*

PARANOMUS ADIANTIFOLIUS *Salisb. ex Knight*
Paranomus spathulatus *N. E. Br.* non O. Kuntze
Nivenia parvifolia *R. Br.*

A second example of confusion in nomenclature is a tall species reaching six feet in height and little branched. As in the case of *Paranomus spathulatus* it has two kinds of leaf, the upper simple, the lower dissected. It would appear that such a plant would not be easily overlooked. Such, however, is not the case. As far as I know only one botanist of recent times has seen it growing. He was Dr. John Muir, a keen collector in the Riversdale Area. It is likely that it grows in rather inaccessible places. Niven, its discoverer, gave the locality as mountains near the Gouritz River, a place where Dr. Muir found it nearly one hundred years later. It was named *Paranomus longicaulis* by Salisbury in 1809, based on one of Niven's specimens. What is almost certainly the same species was described by Robert Brown in 1810 as *Sorocephalus diversifolius*, also based on a specimen collected by Niven "prope Goud Rivier". The name Goud Rivier was that used by early travellers such as Thunberg and Masson for the river to-day known as the Gouritz River. As Niven's explorations took place but a few years later than those of Thunberg and Masson, it is likely that the name Goud Rivier was still in use and that Niven made use of both names on his field tickets. If so this would dispose of the unwarranted assumption made by N. E. Brown in 1933 that "Goud" was an abbreviation for "Goudini". The assumption was made because what appears to be the only surviving specimen collected by Niven, and now in the British Museum, bears a label on which an old and faded inscription, records that it came from the Roodezand and was given to Mr. A. White by Mr. Niven. The specimen is imperfect and has but one inflorescence below which are entire leaves only. It seems probable that it was left over after better specimens had been presented to large herbaria. There is no doubt that it is the same plant as Muir 3721. It is also the species described by Phillips in 1926 in the Flowering Plants of Southern Africa as *Paranomus diversifolius*.

If this species be correctly placed in Paranomus, then the correct name is undoubtedly *Paranomus longicaulis* Salisb. ex Knight. It will be noted, however, that Robert Brown whose judgment was sound, did not place it in Nivenia but regarded it as an aberrant form of Sorocephalus. In his concept of the genus Nivenia Robert Brown laid emphasis on the woody and persistent nature of the bracts in the fruiting heads. This important diagnostic feature has been overlooked by recent botanists. All the specimens of this particular species at present in herbaria, bear mature but not withered flowers and the bracts of each partial inflorescence are somewhat membranous, giving the impression that they are likely to be deciduous. If this should prove to be the case, then it differs markedly from all other species of Paranomus and should be removed from it. It is important that living material be studied so that this critical point can be settled. If the bracts are persistent and become woody then it undoubtedly belongs to Paranomus but if this be not so, then a new monotypic genus will probably need to be established for the species does not appear to fit comfortably into Sorocephalus to which Robert Brown assigned it.

A group of species in which all leaves are dissected has suffered greatly at the hands of taxonomists. *Paranomus spicatus* was the first of these species to be named. It was founded by Bergius in 1767 as *Leucadendron spicatum.* A little later Thunberg recognised two more species in this group, giving them the names *Protea candicans* and *Protea lagopus*. The specimen in his herbarium bearing the name *Protea spicata* does not belong to the species given that epithet by Bergius but is a duplicate of his species, *Protea candicans.* Robert Brown in 1810 showed a remarkably clear conception of this group and the five species he described are easily recognised by anyone familiar with the genus. He retained two of the old species under the combinations *Nivenia spicata* and *Nivenia lagopus*. He described three new species under the names *Nivenia crithmifolia*, *Nivenia media* and *Nivenia mollissima*. Not one of these may retain Brown's epithets though all are good species. Salisbury's *Paranomus crithmifolius*, published in 1809, is merely a synonym of *Paranomus spicatus*, based on *Leucadendron spicatum* of Bergius. Unfortunately the rules of nomenclature prevent us from using the epithet *crithmifolius* in Paranomus in any sense other than that of Salisbury. Another name must be found for this very distinct and common species. There is little doubt that *Nivenia bolusii* Gandoger is this species for it was collected by Bolus near Caledon, a region in which the species is very common. However, the type has not yet been found among Gandoger's plants in Lyon. Bolus noted in his copy of Gandoger's paper that he had not kept in the Bolus Herbarium a specimen bearing the number quoted by Gandoger. If the type be found, the correct citation of this species will be *Paranomus bolusii* (Gandoger) comb. nov. However, with an inadequate description and with the type missing, it seems unwise to make this new combination at the present time. If it be necessary to give the species a new name, a suitable one would be *Paranomus caledonensis* for it is common in the Caledon Division and does not extend far outside its boundaries. *Nivenia media* R. Br. is almost certainly a synonym of *Paranomus bracteolaris* Salisb. ex Knight. It is a common species on the mountain ranges running from van Rhynsdorp in the north to Porterville in the south. The only doubt arises from the fact that Salisbury published this species as having been collected by Niven on high mountains near Swellendam, a region in which this species has never been found. At Kew there is a specimen collected by Niven and presented by Salisbury to that institution as *Paranomus bracteolaris*. On the ticket accompanying the specimen no precise locality is given, merely the statement that it grew in high alpine situtations everywhere. It is therefore probable that the locality published in Knight's work is wrong, one of the unfortunate results of the book's hurried preparation.

Paranomus abrotanifolius Salisb. ex Knight, of which the type is at Kew, was assumed to be an undescribed species and given the name of *Nivenia micrantha* Schlechter in 1900. In 1953 it was transferred to Paranomus by Compton. However, Niven's type leaves no doubt that it is one of Salisbury's species and must bear the name given at the beginning of this paragraph.

The last of this group of species is *Paranomus candicans* (Thunb.) O. Kuntze, based on *Protea candicans* of Thunberg. Salisbury's *Paranomus argenteus* and Brown's *Nivenia mollissima* are synonyms. *Nivenia laxa* Schlechter which is found on mountains in the Worcester area may also be a synonym for although it lacks the silvery appearance of the typical species, the differences scarcely justify its recognition as a separate species. Sub-specific rank seems more appropriate in which case its citation should be *Paranomus candicans* (Thunb.) O. Kuntze sub. sp. *laxa* Schlechter comb. nov.

A botanist whose work is confined to the herbarium, is almost certain to create unnecessary species in a taxon such as *Paranomus spathulatus*. In the less arid parts of its range it is usual to find on every plant both dissected and entire leaves, the latter showing great variation in form. Under dry conditions the leaves are smaller and the plant may cease to form dissected leaves. In 1962 when studying some dry slopes near the Gouritz River, an area was seen which had been swept by fire the previous season. On it numerous young plants had grown from seed. Some bore dissected leaves only, others bore dissected leaves below and entire leaves above. On a nearly unburnt slope the majority of plants were old and most lacked dissected leaves. It is inevitable that when a species such as this is studied from herbarium specimens only, the number of forms to which specific names are given will be too great. This is the case here. *Nivenia marginata* R. Br. and *Nivenia muirii* Phill. & Hutch. are merely growth forms of *Paranomus spathulatus*. The same is the case in another species, *Paranomus dregei* where a species with rather broad and numerous entire leaves was treated as a new species and named *Nivenia marlothii* by Phillips. Later a new combination, *Paranomus marlothii*, was made for the species by N. E. Brown. This was unfortunate for Marloth was greatly interested in the genus and it would have been fitting to have had his name commemorated in one of the species. Though the combination *Paranomus marlothii* was made for a non-existent species and by a botanist who had not seen the type, rules of nomenclature prevent its use in any species published subsequently.

In 1810 Robert Brown clearly defined eight species. It is regrettable that when that part of the Flora Capensis dealing with the Proteaceae was published over one hundred years later, though Brown's illegitimate name was adopted, his sound conception of both the genus and the species was not appreciated. In the Flora Capensis the number of species was increased to thirteen. However only five of them, two new, are entitled to retain the names given them there. Earlier names exist for four species. Two names disappear in synonomy. The remaining two species are hopelessly confused. Under *Nivenia spicata* six distinct species are assembled, not one of which is the species to which Bergius gave the epithet *spicatum* over two hundred years ago. *Paranomus spicatus*, based on Bergius' type, together with two other species, appear under *Nivenia crithmifolia*.

A conservative estimate at the present time is that there are seventeen species of which four are new and as yet undescribed. In a genus of but moderate size it is surprising that so many misfortunes should have attended it since its inception.

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